

WHAT IS CLAIMED IS:

1. An information write/read head for a heat-assisted read/write system wherein a recording track on a recording medium is partially heated by projecting thereto a light beam, comprising:

a magnetic head for magnetically recording or reading information with respect to the recording track; and

an optical slit which allows the light beam for use in heating the recording track to pass therethrough to be guided to the recording track,

wherein said optical slit includes a light emitting section whose width is shorter than a diffraction limit of the light beam.

2. The information write/read head as set forth in claim 1, wherein:

the light emitting section of said optical slit has a length in a longitudinal direction of not shorter than the diffraction limit of the light beam.

3. The information write/read head as set forth in claim 2, wherein:

said optical slit is formed in such a manner that a longitudinal direction of the light emitting section intersects with a longitudinal direction of a magnetic

gap of said magnetic head.

4. The information write/read head as set forth in claim 1, wherein:

said optical slit is formed in such a manner that its longitudinal direction is substantially parallel to a polarized direction of the light beam to be incident onto said optical slit.

5. The information write/read head as set forth in claim 1, wherein:

said optical slit is formed in such a manner that its longitudinal direction coincides with a polarized direction of the light beam to be incident onto said optical slit.

6. The information write/read head as set forth in claim 1, wherein:

said optical slit has a light incident section of a larger area than the light emitting section.

7. The information write/read head as set forth in claim 6, wherein:

said optical slit has two side parts facing one another which extend from the light incident section to the light emitting section, said two side parts being

inclined with respect to a light incident direction,  
and

said two side parts totally reflect light incident  
from the light incident section.

8. The information write/read head as set forth  
in claim 1, wherein:

said optical slit is made of a light-transmissive  
material.

9. The information write/read head as set forth  
in claim 1, wherein:

said magnetic head and said optical slit are  
formed in one integral part.

10. The information write/read head as set forth  
in claim 9, further comprising:

a heat-shielding layer formed between said  
magnetic head and said optical slit.

11. The information write/read head as set forth  
in claim 1, wherein:

said optical slit is formed in such a manner that  
its longitudinal direction is substantially parallel to  
a longitudinal direction of the recording tracks.

12. The information write/read head as set forth in claim 1, wherein:

said optical slit is formed in front of said magnetic head in a scanning direction of the recording tracks.

13. An information writing/reading device for a heat-assisted read/write system wherein a recording track on a recording medium is partially heated by projecting thereto a light beam, comprising:

an information write/read head which includes i) a magnetic head for magnetically recording or reading information with respect to the recording track; and ii) an optical slit which allows the light beam for use in heating the recording track to pass therethrough to be guided to the recording track, wherein said optical slit includes a light emitting section whose width is shorter than a diffraction limit of the light beam;

an optical system for guiding the light beam to a light incident section of said optical slit.

14. The information writing/reading device as set forth in claim 13, wherein:

said optical system includes a semiconductor laser device, and

said semiconductor laser device is formed in such

a manner that its laser output end face is put together with the light incident section of said optical slit.

15. The information writing/reading device as set forth in claim 13, wherein:

said optical system further includes an optical fiber, and

the light beam is guided to the light incident section of said optical slit via said optical fiber.

16. The information writing/reading device as set forth in claim 13, further comprising:

a slider for scanning on an information writing/reading disk as a recording medium;

writing means for outputting a writing signal with respect to said magnetic head; and

reading means for inputting a reading signal from said magnetic head.

17. The information writing/reading device as set forth in claim 13, further comprising:

tracking means which detects a light beam transmitted through or reflected from said recording medium, which has passed through said optical slit, and performs a tracking operation of the recording tracks based on the transmitted light or the reflected light

as detected.

18. An information recording medium, comprising:

tracking-use marks for writing information based on changes in refractive index, which are formed along recording tracks; and

data areas for writing information magnetically, which are formed along the recording tracks,

wherein said tracking-use marks have a length of not shorter than a diffraction limit of a light beam in a direction along the recording tracks and a width of not wider than the diffraction limit of the light beam in a direction orthogonal to the recording tracks.

19. The information recording medium as set forth in claim 18 being a recording/reading disk.

20. The information recording medium as set forth in claim 18, wherein:

first tracking-use marks and second tracking-use marks of a substantially a same shape are formed in said tracking areas; and

said first tracking-use marks and said second tracking-use marks are formed at predetermined intervals in a tracking direction and displaced one another in a direction orthogonal to the tracking

direction.

21. The information recording medium as set forth in claim 20, wherein:

said first tracking-use marks and said second tracking-use marks are offset in mutually opposite directions by substantially same offset amounts about a central line of the recording track.

22. The information recording medium as set forth in claim 21, wherein:

said first tracking-use marks and said second tracking-use marks respectively have side parts which are formed in the tracking direction, so as to be substantially coincide with the central line of the recording track.

23. An information write/read head, comprising:

a magnetic head for magnetically writing or reading information with respect to recording tracks on a recording medium for writing thereon or reading therefrom information by a heat-assisted system; and

an optical slit for heating the recording tracks by projecting therethrough a light beam, said optical slit having a light emitting section of a width of not wider than a diffraction limit of the light beam.

24. The information write/read head as set forth in claim 23, wherein:

said optical slit includes a light emitting section whose length in a longitudinal direction is not shorter than the diffraction limit of the light beam, and

a longitudinal direction of the light emitting section intersects a longitudinal direction of a magnetic gap of said magnetic head.

25. The information write/read head as set forth in claim 23, wherein:

a polarized direction of the light beam to be incident onto said optical slit is determined based on the longitudinal direction of said optical slit.

26. An information writing/reading device, comprising:

an information write/read head, which includes:

i) a magnetic head for magnetically writing or reading information with respect to recording tracks on a recording medium for writing thereon or reading therefrom information by a heat-assisted system; and

ii) an optical slit for heating the recording tracks by projecting therethrough a light beam, said



optical slit having a light emitting section of a width of not wider than a diffraction limit of the light beam;

a slider which mounts thereon said information write/read head, for scanning an information writing/reading disk as a recording medium;

writing means for outputting a writing signal with respect to the magnetic head;

reading means for receiving a reading signal from the magnetic head; and

converging means for converging light onto the optical slit.

27. The information writing/reading device as set forth in claim 26, further comprising:

tracking means which detects a light beam transmitted through or reflected from said recording medium, which has passed through said optical slit, and performs a tracking operation of the recording tracks based on the transmitted light or the reflected light as detected.

28. A writing/reading disk, comprising:

tracking-use marks for writing information based on changes in refractive index, which are formed along recording tracks; and

data areas for writing information magnetically, which are formed along the recording tracks,

wherein the tracking-use marks have a length of not shorter than a diffraction limit of a light beam in a direction along the recording tracks and a width of not wider than the diffraction limit of the light beam in a direction orthogonal to the recording tracks.

29. The writing/reading disk as set forth in claim 28, wherein:

said tracking-use marks include i) first tracking-use marks having first and second long sides opposing one another, said first long side being formed along a central line of the recording track in a data area, and ii) second tracking-use marks having first and second long sides opposing one another, said second long side being formed along the central line of the recording track in the data area.

30. An information recording medium, comprising: tracking-use marks formed along recording tracks, whereon information are recorded based on changes in refractive index, wherein:

said tracking-use marks have a length of not shorter than a diffraction limit of a light beam in a direction along the recording tracks and a width of not

wider than the diffraction limit of the light beam in a direction orthogonal to the recording tracks.

31. The information recording medium as set forth in claim 30, wherein:

said tracking-use marks are recorded in form of protrusions and recessions.

32. A tracking device which performs a tracking operation with respect to an information recording medium comprising tracking-use marks formed along recording tracks, whereon information are recorded based on changes in refractive index, wherein said tracking-use marks have a length of not shorter than a diffraction limit of a light beam in a direction along the recording tracks and a width of not wider than the diffraction limit of the light beam in a direction orthogonal to the recording tracks, said tracking device comprising:

an optical slit which allows a light beam to pass therethrough to be guided to said information recording medium; and

tracking means which detects a light beam transmitted through or reflected from said information recording medium, which has passed through said optical slit, and performs a tracking operation of the

recording tracks based on the transmitted light or the reflected light as detected,

wherein said optical slit has a light emitting section whose width is shorter than the diffraction limit.

By the use of the present invention, the width of the optical slit can be made shorter than the diffraction limit, and the light emitting section can be made shorter than the diffraction limit.